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Mr. Knight, it must pass the cellular substance ; and to show that the cellular substance is pervious to fluids, he quotes an instance from a preceding communication, in which bark was generated on the surface of the cellular substance of pollard oaks. A new experiment is also related in confirmation of this opinion. Various branches of two years old were cut from different trees ; and after the cut surface had been covered with a cement impermeable to water, a portion of the bark was detached from each, so as to expose the surface of the alburnum. They were then immersed in coloured infusions for twenty hours, and were found to have imbibed the colour between the alburnous tubes, apparently through the cellular substance.

When an incision is made into the alburnum near the root, and sap is seen to flow from it, it may be observed to run even more abundantly from the upper surface of the incision ; and since the quantity which exudes is full a hundred times more than was previously contained in the alburnous tubes, it appears evident that it is raised through some other channel.

Mr. Knight concludes, therefore, that the sap ascends through the cellular substance, and conceives that part to be so organized as to permit the sap to escape more readily *upwards* than in any other direction ; and, by its alternate contraction and expansion, to be fully capable of propelling the sap with all the impulse which it is known to have in the spring.

The alburnous tubes appear to the author to answer also another purpose, since their cylindrical form occasions the strength of the materials employed to be the greatest possible.

The author concludes by observing, that though he retracts an opinion formerly entertained respecting the ascent of sap through the alburnous tubes, yet his opinions concerning its subsequent motion through the central vessels, leaves, and bark, remain unchanged.

Eclipses of the Satellites of Jupiter, observed by John Goldingham, Esq. F.R.S. and under his Superintendance, at Madras, in the East Indies. Read June 30, 1808. [Phil. Trans. 1808, p. 322.]

Mr. Goldingham's observations are prefaced by a short account of the instruments employed, and some general remarks upon the circumstances necessary to be attended to, in drawing inferences from them. Two telescopes were employed, both made by Dollond, of $3\frac{1}{2}$ feet focal length, with a magnifying power between 70 and 80 ; and the time observed by a good clock, with gridiron pendulum, was deduced from the transit of the sun nearest to the eclipse, and verified by the next preceding or following transit.

The longitude of the place of observation is given, as determined from numerous observations of various kinds, that it may be compared with that deduced from each eclipse by means of the time given in the ephemeris.

In noting each observation, the state of the weather is attended to,

the altitude of the planet, the relative situation of the planet and moon, with any other circumstances of twilight or haze that were likely to cause any incorrectness in the observation. To obviate the uncertainty that will always attend the results of such observations, from different states of weather, difference of telescopes, and imperfection of vision in different observers, Mr. Goldingham recommends not to draw any inference from comparison of corresponding immersions alone, without attending to the difference of corresponding emersions also, by which all sources of error will be in a great degree corrected.

Electro-Chemical Researches on the Decomposition of the Earths; with Observations on the Metals obtained from the alkaline Earths, and on the Amalgam procured from Ammonia. By Humphry Davy, Esq. *Sec.R.S. M.R.I.A.* Read June 30, 1808. [*Phil. Trans.* 1808, p. 333.]

In the last Bakerian lecture mention was made of an apparent decomposition of barytes and strontites into oxygen and inflammable matter.

In the prosecution of the same course of experiments upon lime and magnesia, similar results were obtained; for when either of these earths was slightly moistened with water, and thereby rendered a conductor of electricity from a powerful voltaic battery, inflammable matter was developed at the negative surface, and oxygen at the positive. And these phenomena were not dependent on the presence of water; for when the same earths were made conductors, by being in a state of fusion with boracic acid, analogous appearances were produced.

On account of the high inflammability of these bodies, similar experiments were conducted under naphtha, with the hope of preserving the products for examination; but although dark opaque specks, having in some cases an appearance of metallic splendour, were produced, yet, when heat was applied to them under boiling naphtha, there was no appearance of fusion, and consequently no separation from the surrounding undecomposed earth; but when the mass was afterwards thrown into water, an effervescence occurred, and evident decomposition of the water.

A series of experiments were next undertaken upon mixtures of barytes or strontites, of lime or magnesia, of alumine or silex, with potash; and in the case of barytes and strontites, the potassium formed was evidently not pure, but apparently alloyed by another metallic substance.

When barytes, strontites, or lime, was mixed with oxide of silver or mercury, the compounds afforded analogous results when acted on by the voltaic battery.

When these experiments were resumed, after an interval of several weeks, a battery had been prepared with 520 pair of plates; and an attempt was then made to unite the bases of these earths with the